

**REMARKS**

The Applicants respectfully request reconsideration of this application in view of the above amendments and the following remarks.

**35 U.S.C. § 112 Rejection**

The Examiner rejects claim 22 under 35 U.S.C. § 112, second paragraph.

Applicant respectfully submit that claim 22 has been amended to overcome the rejection.

**35 U.S.C. §102(b) Rejection - Bershad**

The Examiner has rejected claims 1, 5-6, 8-9, 13, 15-16, 20, 22-23, 25-26 and 28 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0093919 issued to Bershad, et al. (hereinafter "Bershad"). Applicants respectfully submit that Bershad does not anticipate the present claims.

As amended, claim 1 pertains to a method comprising:

*"transforming a signal from a time domain to a transform domain with a wavelet transform;*  
*adapting a first adaptive filter in the transform domain based on the transformed signal;*  
*estimating a delay of an impulse response based on the adaptation of the first filter;*  
*delaying a signal based on the estimated delay; and*  
*adapting a second adaptive filter in the time domain based on the delayed signal".*

Bershad does not disclose these limitations. In particular, Bershad does not disclose either:

- (1) transforming a signal from a time domain to a transform domain with a wavelet transform;
- or (2) adapting a first adaptive filter in the transform domain.

Bershad discusses fast converging affine projection based echo cancellers for sparse multi-path channels. See e.g., the Title. FIG. 3 of Bershad is a diagram illustrating an AP-based echo canceller. See e.g., paragraph [0011]. FIG. 3 includes an adaptive filter 310 and an adaptive filter 330. FIG. 4A is a diagram illustrating the adaptive filter 310 for the AP-based echo canceller shown in FIG. 3. See e.g., FIG. 4A and paragraph [0012]. FIG. 4B is a diagram illustrating the adaptive filter 330 for the AP-based echo canceller shown in FIG. 3. See e.g., FIG. 4B and paragraph [0013]. Inspection of FIGs. 4A and 4B reveals that these adaptive filters both receive signal  $u(k)$ . As is known in the art,  $u(k)$  is the notation used for the time domain. Accordingly, both the adaptive filter 310 of FIG. 4A and the adaptive filter 330 of FIG. 4B adapt in the time domain.

In contrast, claim 1 clearly recites: (1) transforming a signal **from a time domain to a transform domain with a wavelet transform**; and (2) adapting a first adaptive filter **in the transform domain**.

One potential advantage of this approach is achieving fast convergence with a relatively small first adaptive filter having relatively few coefficients for purposes of delay estimation.

Anticipation under 35 U.S.C. Section 102 requires every element of the claimed invention be identically shown in a single prior art reference. The Federal Circuit has indicated that the standard for measuring lack of novelty by anticipation is strict identity. *“For a prior art reference to anticipate in terms of 35 U.S.C. Section 102, every element (emphasis added) of the claimed invention must be identically (emphasis added) shown in a single reference.”* In Re Bond, 910 F.2d 831, 15 USPQ.2d 1566 (Fed. Cir. 1990).

Accordingly, Bershad does not anticipate claim 1. Accordingly, claim 1 and its dependent claims are believed to be allowable over Bershad.

Independent claims 9, 16, and 26, and their respective dependent claims, are believed to be allowable for one or more similar reasons.

**35 U.S.C. §103(a) Rejection – Bershad, Ho**

The Examiner has rejected claims 2-4, 10-12, 17-19 and 27 under 35 U.S.C. §103(a) as being unpatentable over Bershad in view of “Rapid Identification of a Space Impulse Response Using an Adaptive Algorithm in the Haar Domain” IEEE Trans. On Signal Processing, Vo. 51, No. 3, pages 623-638, March 2003 by K.C. Ho, et al (hereinafter “Ho”). Without admitting that Bershad should be combined with Ho, the Applicants respectfully submit that the present claims are allowable over Bershad and Ho.

Ho does not remedy all of what is missing in Bershad. As understood by Applicants, Ho describes a two step procedure for a Haar-Basis adaptive echo cancellation algorithm. The first step involves adapting a subset of the Haar basis vectors which span the entire time range of the unknown impulse response. These coefficients are initially adapted and then used to subsequently identify the rest of the Haar coefficients needed to model the unknown channel. The hierarchical structure of the Haar transform facilitates this procedure. The second step involves the adaptation of these coefficients. This avoids the adaptation of many of the coefficients which would be zero anyway.

However, Ho does not disclose or render obvious both adapting a first adaptive filter **in the transform domain** based on the transformed signal and adapting a second adaptive filter **in the time domain** based on the delayed signal.

Accordingly, the independent claims and their respective dependent claims are believed to be allowable over Bershad and Ho, which combination may not even be appropriate.

**35 U.S.C. §103(a) Rejection - Bershad**

The Examiner has rejected claims 21, 24, and 29 under 35 U.S.C. §103(a) as being unpatentable over Bershad.

Applicants respectfully submit that these claims are believed to be allowable over Bershad for at least the reason that Bershad does not disclose the limitations in the respective independent claims. The discussion above is pertinent to this point.

**35 U.S.C. §103(a) Rejection - Bershad, Van Gerwen**

The Examiner has rejected claims 7 and 14 under 35 U.S.C. §103(a) as being unpatentable over Bershad and U.S. Patent No. 4,903,247 issued to Van Gerwen (hereinafter "Van Gerwen").

Since the independent claims have been shown to be allowable over Bershad and since Van Gerwen does not appear to remedy what is missing in Bershad, Applicants elect at this time not to address the appropriateness of combining these references or other aspects regarding the rejection of these dependent claims 7 and 14.

**Conclusion**

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the cited art of record and are in condition for allowance. Applicants respectfully request that the rejections be withdrawn and the claims be allowed at the earliest possible date.

**Request For Telephone Interview**

The Examiner is invited to call Brent E. Vecchia at (303) 740-1980 if there remains any issue with allowance of the case.

**Request For An Extension Of Time**

The Applicants respectfully petition for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17 for such an extension.

**Charge Our Deposit Account**

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: 11/16/07

By Brent E. Vecchia  
Brent E. Vecchia, Reg. No. 48,011  
Tel.: (303) 740-1980 (Mountain Time)

1279 Oakmead Parkway  
Sunnyvale, California 94085-4040

App. No. 10/749,987  
BEV/wlr

- 11 -

Dkt. No. 42P17667